ORDER No. RD8003-TI030

Technical Information

Radio

FM-LW-MW-SW 6-Band
Portable Radio

RF-2800LBS
RF-2900LBS

Subject: Frequency Counter Circuit

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Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka, Japan

RF-2800/RF-2900 Frequency Counter Circuit

I. Outline:

The RF-2800/RF-2900 displays the frequency of the received broadcast by counting the frequency of the local oscillator and scaling accordingly. Figure 1 is a block diagram for the receiver. The following relationships exist between the reception frequency (f_s), the local oscillator frequency (f_o), the intermediate frequency (f_i) and the display frequency (f_D).

(A) $f_s \pm f_i = f_o$ . . . (1)

(B) $f_d = f_s = f_o \pm f_i$ . . . (2)

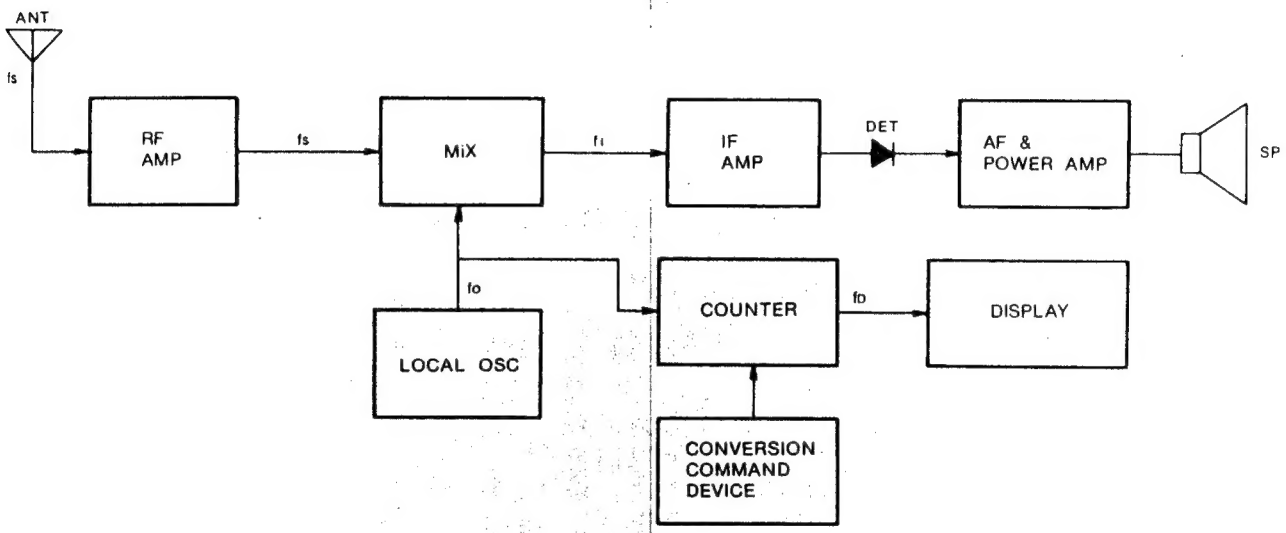


Fig. 1

With reference to figure 1, for example

Reception frequency (f_s) = 10 MHz
Intermediate frequency (f_i) = 455 kHz

Under these conditions, the local oscillator frequency (f_o) must be, according to formula (1), 10.455 MHz (called "upper local oscillation") or 9.545 MHz (called "lower local oscillation"). Thus, if 10.455 MHz is used as the local oscillator signal:

Display frequency (f_D) = 10.455 (f_o) − 0.455 (f_i) = 10 MHz (f_s) . . . . . (3)
Therefore, the display frequency is equivalent to the reception frequency.
The subtraction of the 0.455 MHz (f_i) is accomplished by the conversion command device to the counter.

If the unit were designed to use the lower local oscillator frequency, a signal (preset frequency = +0.455 MHz) would be applied to the counter in order to add 0.455 MHz.

At the same time, in models which use different frequency, such as 2 MHz, for the intermediate frequency (f_i), a conversion signal is applied to the counter in order to add (or subtract) 2 MHz, so that the reception frequency will be correctly displayed.
In short, the conversion signal must be equal to $\pm f_i$.

II. Block Diagram

Figure 2 is a chart of the reception frequency, local oscillator frequency and intermediate frequency for each band.

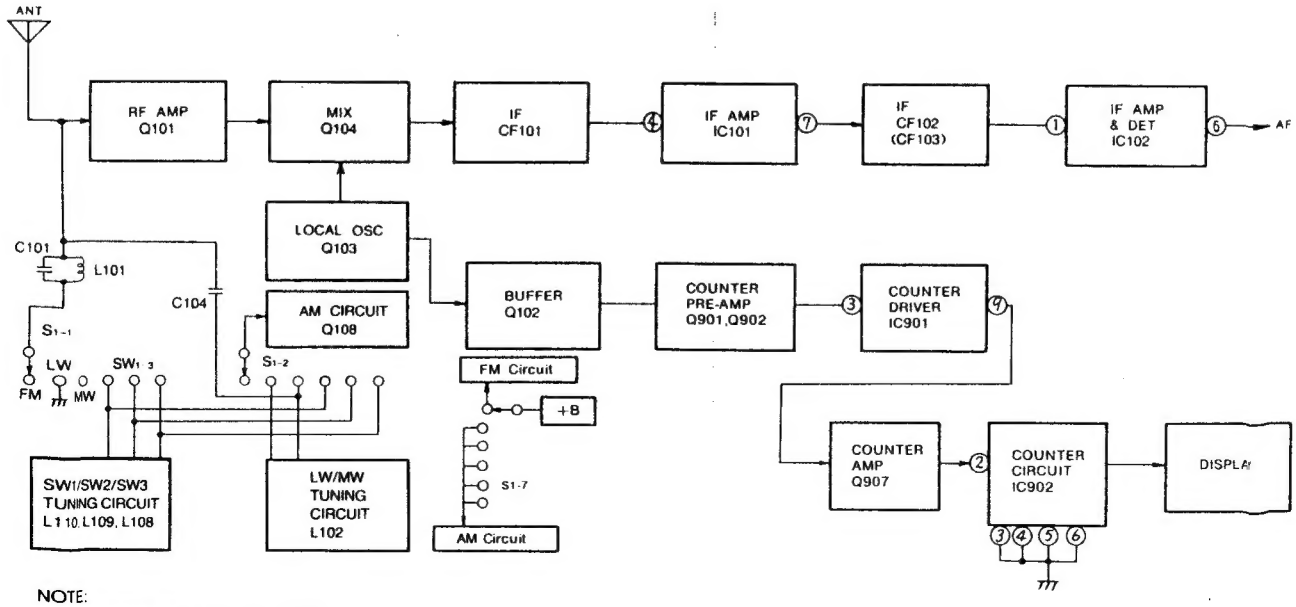
Band	Signal Frequency (MHz)	Intermediate Frequency (MHz)	Local Osc. Frequency (MHz)
FM	87.5 ~ 108	10.7	98.2 ~ 118.7
LW	0.150 ~ 0.410	0.455	0.605 ~ 0.865
MW	0.525 ~ 1.610	0.455	0.980 ~ 2.065
SW1	3.2 ~ 8.0	2	5.2 ~ 10.0
SW2	8.0 ~ 16.0	2	10.0 ~ 18.0
SW3	16.0 ~ 30.0	2	18.0 ~ 32.0

Fig. 2

Because, the upper local oscillator frequency is used the conversion signal is subtracted from the counter circuit for each band.
As can be understood from the table in figure 2, an intermediate frequency of 10.7 MHz is used for the FM band. Because the upper local oscillator frequency is used, the reception frequency is displayed after 10.7 MHz has been subtracted from the local oscillator frequency.

For the LW, MW bands, 455 kHz is subtracted from the local oscillator frequency.
For the SW bands, 2 MHz is subtracted from the local oscillator frequency.

Figures 3 and 4 are block diagrams which include the RF, Local Oscillator, IF and Counter circuits.
The subtraction is accomplished through logic signals applied to pins 3, 4, 5 and 6 of IC902.



NOTE:
1. IC902 terminal Nos. 3, 4, 5, 6 for Preset L condition in terminals 3, 4, 5 and 6 : −10.7MHz
2. S1:Band Selector FM/LW/MW/SW1/SW2/SW3 shown at FM position.

Fig. 3 FM Section Block Diagram

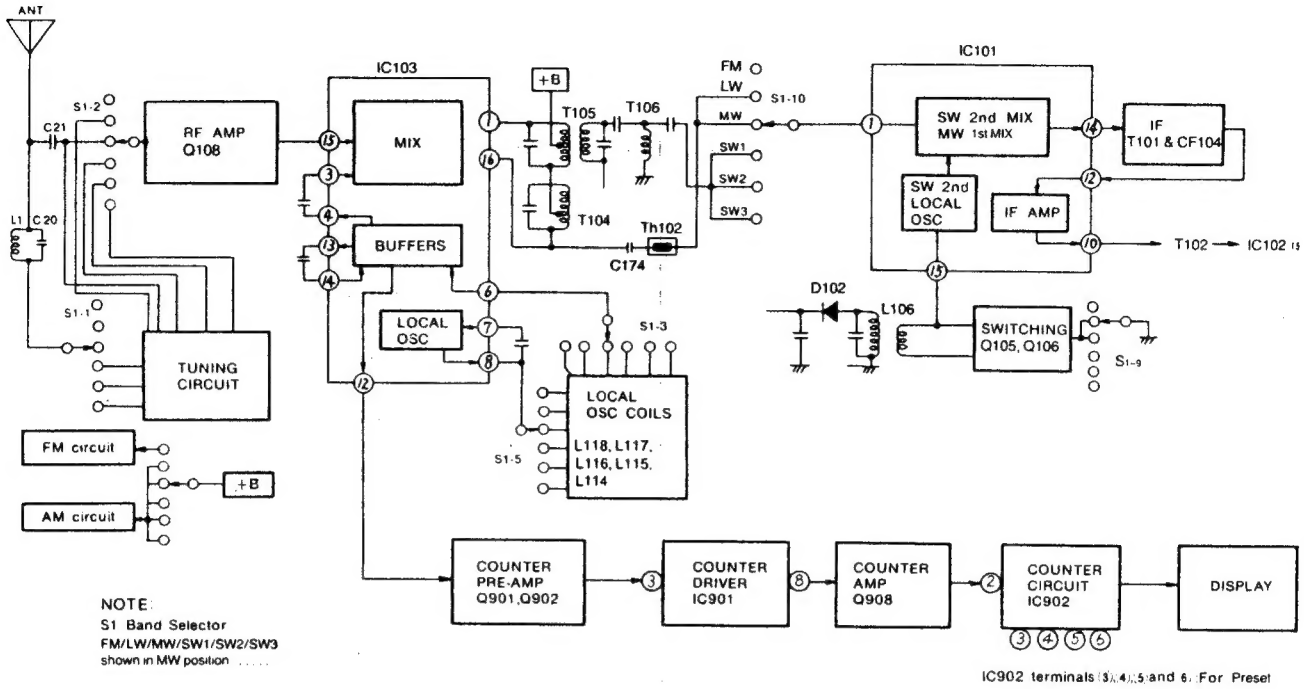


Fig. 4 LW/MW/SW Section Block Diagram

III. Preset Selector Circuit

Figure 5 shows the relationship between the preset terminals (3, 4, 5 and 6) of IC902 and the preset frequency.

Band	Preset terminal				Preset Frequency (MHz)
	3	4	5	6	
FM	L	L	L	L	−10.7
LW/MW	L	H	L	L	−0.455
SW1	H	H	H	L	−2.0
SW2	H	H	H	L	−2.0
SW3	H	H	H	L	−2.0

Fig. 5

Figure 6 shows the preset selector circuitry.

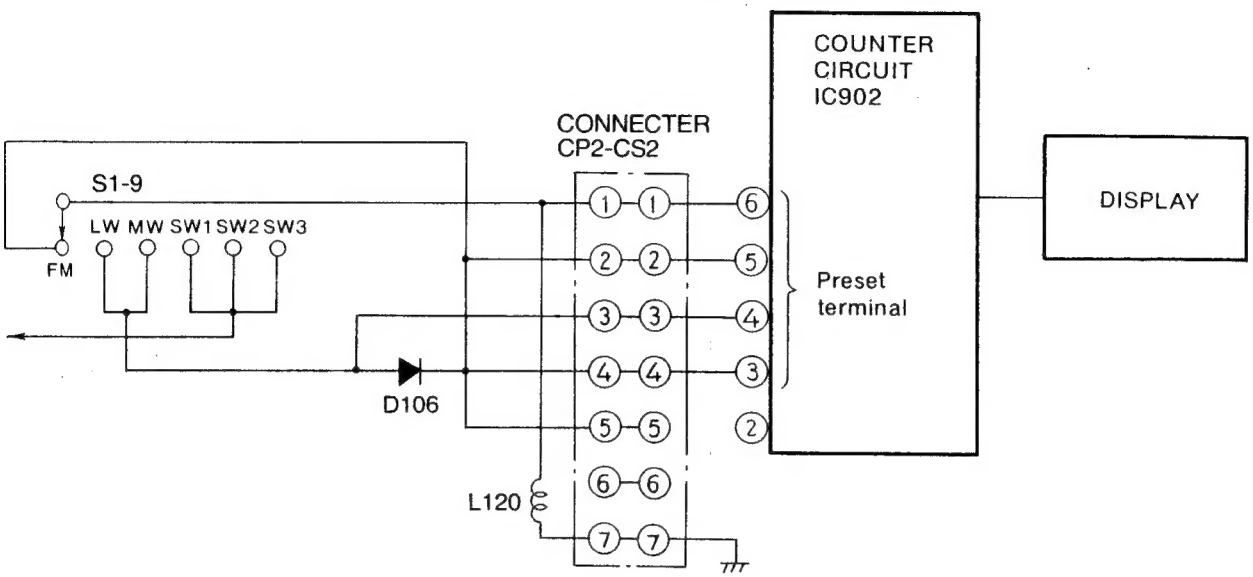


Fig. 6

A. For FM:
   (a) Terminal 6 of IC902 becomes an "L" level. (through connectors Pin 1→L120→Pin 7→GRND)
   (b) Terminal 5 of IC902 becomes an "L" level. (through S1–9.→Connector Pin 2.)
   (c) Terminal 4 of IC902 becomes an "L" level. (through S1–9→D106→Connector Pin 3)
   (d) Terminal 3 of IC902 is set at an "L" level. (through S1–9→Connector Pin 4)
   As a result, (refer to the table in figure 5) the counter circuit subtracts 10.7 MHz from the local oscillator frequency (the input signal), and the result is displayed as the reception frequency.

B. In the same way, for the LW, MW and SW bands the condition of each preset terminal is changed by the band selector (S1–9) consenquently, the preset frequency shown in the table in figure 5 is obtained, and the correct reception frequency is displayed.

IV. Counter Signal Circuitry

Figure 7 shows the counter signal circuitry.

A. For each band, the local oscillator signal from the local oscillator circuitry is selected (FM, LW, MW or SW) by SW-A, and is supplied to terminal 3 of the driver circuit (IC901).
B. This signal is frequency divided (1/8) by IC901, and is output from terminal 8. At the same time, a signal (frequency divided by 1/80) is output from terminal 9.

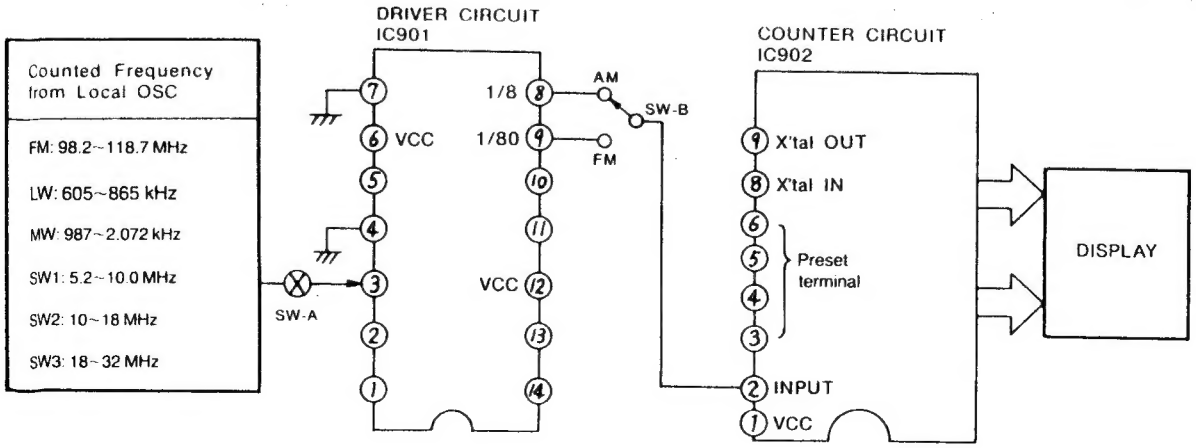


Fig. 7

C. These two output signals are selected (by SW-B): the 1/8 frequency divided output (from terminal 8) for the LW, MW band and SW_1~SW_3 bands, and the 1/80 frequency divided output (from terminal 9) for the FM band are applied to the input terminal (terminal 2) of the counter circuit (IC902).
D. These frequencies are converted, by IC902, into the original local oscillator frequencies. Moreover, depending upon the signal applied to the preset terminals, the necessary frequency for each band is subtracted from the derived local oscillator frequencies and the resulting frequency is supplied to the display.

V. Signal Selector Circuitry

Figure 8 shows the signal selector circuitry for the counter.

A. For the FM band, since the band selector (S_{1-9}) is in the "FM" position, the base of each transistor (Q904, Q905 and Q906) becomes an "L" level, consenquently, Q904 and Q905 turn on, and Q906 turns off.
As a result, the signal from the FM band local oscillator flows as shown below, and is counted at the counter circuitry.

FM Local osc → C902 → Q901 → Q902 → C908 → IC901(3) → IC901(9) → C914 → Q907 → IC902(2)

In this case instance, the local oscillator circuitry for the LW, MW and SW bands does not function (refer to figures 3, 4 and the +B selector).
The signal (AM) from the 1/8 frequency divider is output from terminal 8 of IC901.
However, because Q905 is turned on thus shorting its collector to emitter junction, the base to emitter junction of Q908 is also shorted, therefore, the signal current can not flow to the counter circuit.

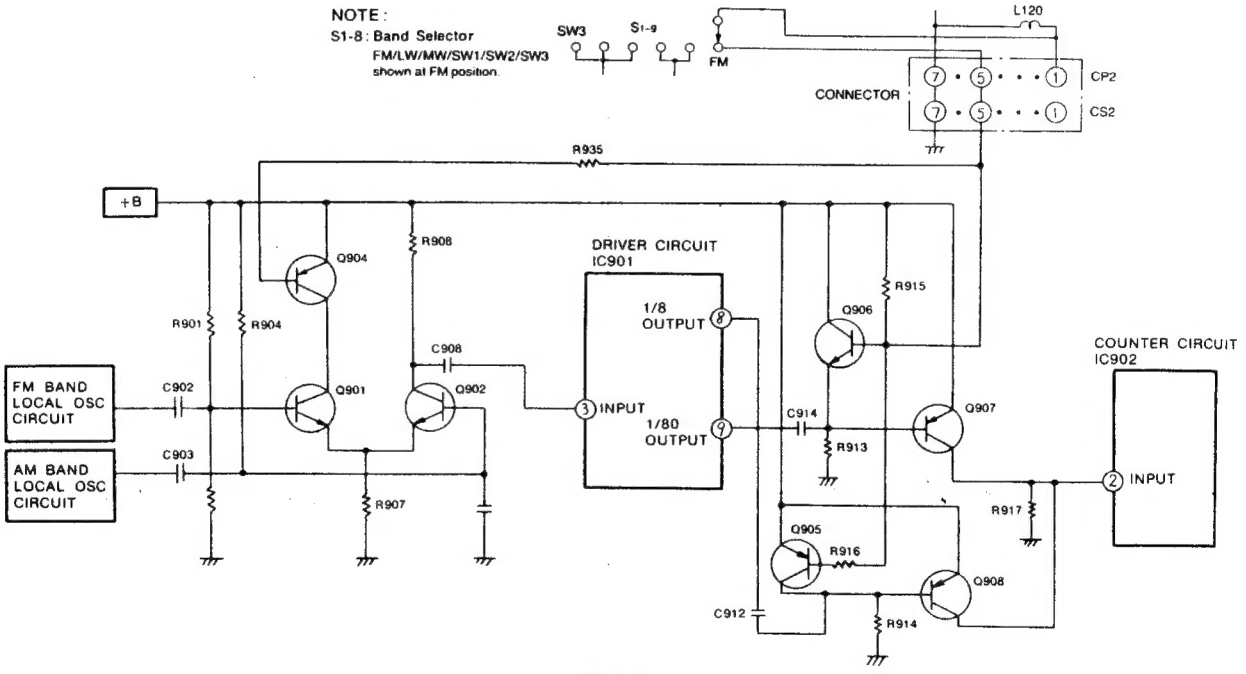


Fig. 8

B. For the LW, MW and SW_1~SW_3 bands, S_{1-9} is open, the base (Q904, Q905 and Q906) become an "H" level, consenquently Q904 and Q905 turn off, and Q906 turns on.
As a result, transistor Q907 turns off (base to emitter junction shorted by Q906) which results in Q901 turning off. Therefore, the signal from the AM local oscillator circuit flows as shown below, and is supplied to the counter circuitry (IC902).

AM local osc → C903 → Q902 → C908 → IC901(3) → IC901(8) → C912 → Q908 → IC902(2)

In this case, the local oscillator circuitry for the FM band does not function.

The above is a description of the operation of the frequency counter circuitry for models RF-2800/RF-2900. The frequency counter circuitry for other models is similar. Refer to RF-4900 Technical Information (Order No. RD8002-T1028), because the counter circuitry for models RF-2800/RF-2900 uses the same LSI as model RF-4900.

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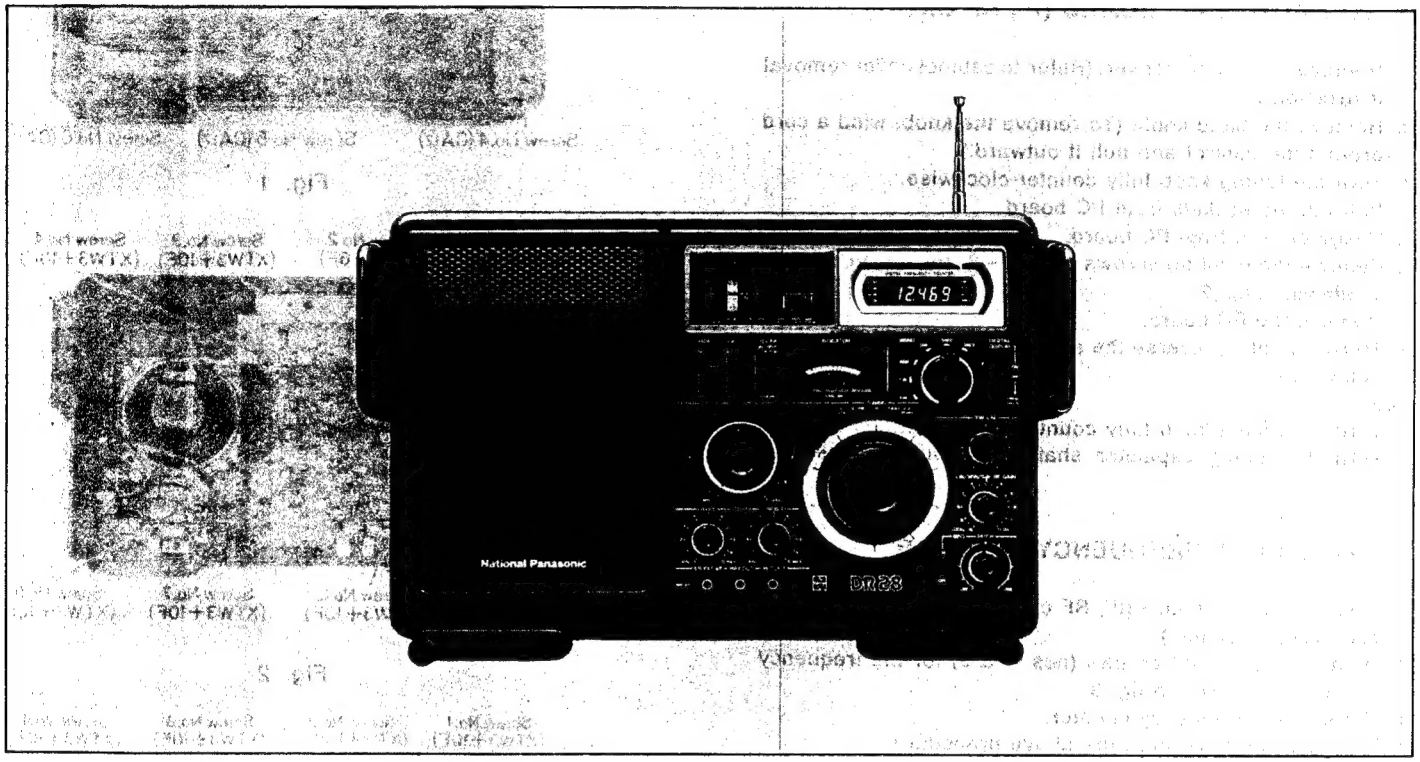
Service Manual

Radio

FM/LW/MW/SW
6-BAND PORTABLE RADIO

RF-2800LBS



■ SPECIFICATIONS

Frequency Range:	FM	87.5~108 MHz
	LW	150~410 kHz (2000~731m)
	MW	525~1610 kHz (571~186m)
	SW_1	3.2~8 MHz (93.8~37.5m)
	SW_2	8~16 MHz (37.5~18.7m)
	SW_3	16~30 MHz (18.7~10m)
Intermediate Frequency:	FM	10.7 MHz
	AM (LW, MW & SW)	455 kHz
Sensitivity:	FM	2.5μV (S/N 26 dB), 2μV (3 dB down limitter sens.)
	LW	70μV/m (S/N 6 dB), 600μV/m (S/N 26 dB)
	MW	30μV/m (S/N 6 dB), 400μV/m (S/N 26 dB)
	SW_1	1.8μV (S/N 6 dB), 19μV (S/N 26 dB)
	SW_2	0.8μV (S/N 6 dB), 9μV (S/N 26 dB)
	SW_3	1.2μV (S/N 6 dB), 13μV (S/N 26 dB)
Power Output:	3W DC Maximum	

Power Source:	AC 110~125V/220~240V 50-60 Hz or 9V (Six "D" Size Flashlight Batteries) (National UM-1 or equivalent)
Power Consumption:	11W (AC Only)
Speaker:	10 cm (4") PM Dynamic Speaker
Dimensions:	381(Wide) × 246(High) × 120(Deep)mm (15" × $9\frac{11}{16}$" × $4\frac{3}{4}$")
Weight:	2.3 kg. (8 lb. 10 oz.) without batteries
Impedance:	
Speaker	8Ω
Earphone Jack	8Ω
Multiplex Out Jack	10kΩ (40mV)
FM Antenna Terminal	75Ω
Phono Jack	500kΩ (50mV)
Recording Out Jack	80kΩ (100mV)

Specifications are subject to change without notice for further improvement.

National Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka, Japan

■ TO REMOVE CABINET COVER

1. Remove the battery cover.
2. Remove the six (6) screws (nos. 1~6) for the cabinet cover, as shown in fig. 1.
3. Remove the cabinet cover.
4. Pull out sockets from PC board.
5. To reassemble, reverse the above procedure.

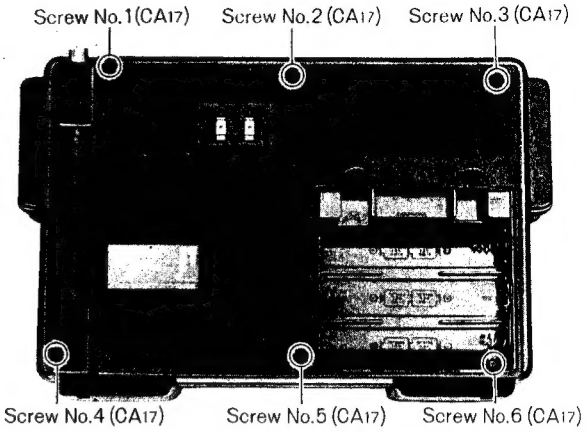


Fig. 1

■ TO REMOVE PC BOARD (IF, RF Circuit)

1. Remove the cabinet cover. (Refer to cabinet cover removal instruction.)
2. Remove the band knob. (To remove the knob, wind a cord around the control and pull it outward.)
3. Turn the tuning knob fully counter-clockwise.
4. Pull out the sockets from PC board.
5. Unsolder lead from PC board.
6. Remove the eight (8) screws (nos. 1~8) for the PC board, as shown in fig. 2.
7. Remove the PC board.
8. To reassemble, reverse the above procedure and note the followings.

Notes

1. Turn the tuning knob fully counter-clockwise.
2. Turn the tuning capacitor shaft fully counter-clockwise.

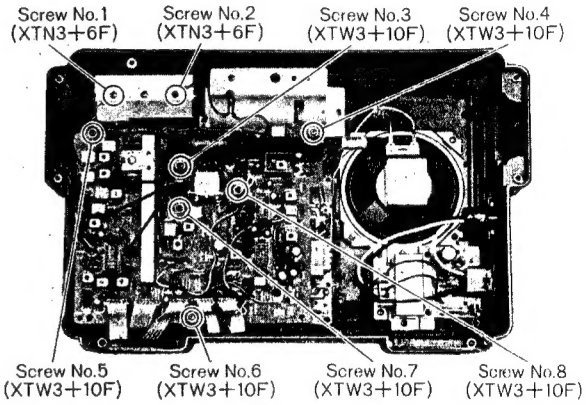


Fig. 2

■ TO REMOVE FREQUENCY COUNTER

1. Remove the PC board (IF, RF circuit). (Refer to PC board removal instruction.)
2. Remove the two (2) screws (nos. 1 & 2) for the frequency counter, as shown in fig. 3.
3. Remove the frequency counter.
4. To reassemble, reverse the above procedure.

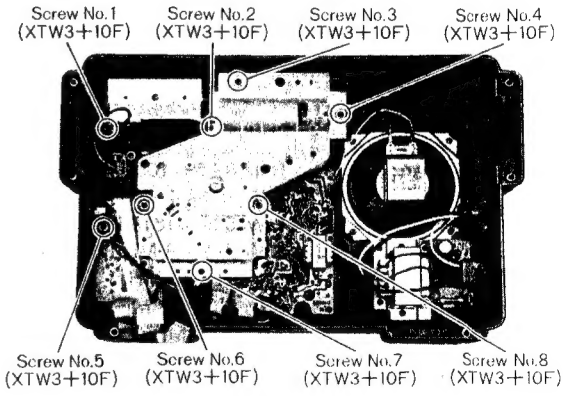


Fig. 3

■ TO REMOVE PC BOARD (Frequency Counter)

1. Remove the frequency counter. (Refer to frequency counter removal instruction.)
2. Remove the four (4) screws (nos. 1~4) for the frequency counter cover, as shown in fig. 4.
3. Remove the two (2) screws (nos. 1 & 2) for the PC board, as shown in fig. 5.
4. Remove the PC board.
5. To reassemble, reverse the above procedure.

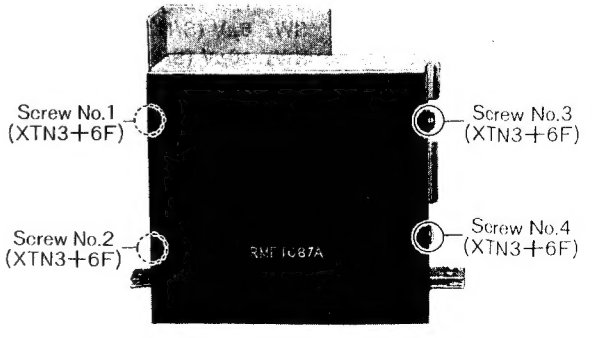


Fig. 4

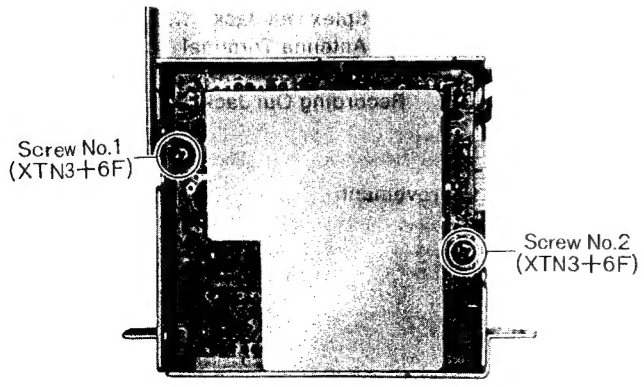


Fig. 5

■ TO REMOVE DIAL SCALE CHASSIS

1. Remove the PC board (IF, RF circuit). (Refer to PC board removal instruction.)
2. Remove the tuning knob.
3. Remove the six (6) screws (nos. 3~8) for the dial scale chassis, as shown in fig. 3.
4. Remove the dial scale chassis.

■ TO REMOVE DIAL MECHANISM

1. Remove the dial scale chassis. (Refer to dial scale removal instruction.)
2. Remove the dial belt, as shown in fig. 7.
3. Remove the two (2) screws (nos. 1 & 2) for the dial mechanism, as shown in fig. 6.
4. To reassemble, reverse the above procedure and note the followings.

Notes

1. Turn the tuning shaft fully counter-clockwise.
2. Set the dial scale at the position, as shown in fig. 7.
3. Attach the dial belt.
4. Refer to dial scale removal instruction.

■ TO REMOVE DIAL SCALE

1. Remove the dial scale chassis. (Refer to the dial scale chassis removal instruction.)
2. Remove the one (1) screw for the dial scale spring, as shown in fig. 7.
3. Remove the dial scale.
4. To reassemble, reverse the above procedure and note the followings.

Notes:

1. Loosen the two (2) screws (nos. 1 & 2) for the dial scale gear, as shown in fig. 8.
2. Set the catch of dial scale gear to the start point of dial scale, as shown in fig. 9.
3. Turn the tuning shaft fully counter-clockwise.
4. After mounting the PC board (IF, RF circuit), turn the dial scale by pushing the catch of dial scale and set the start point of dial scale to the catch of cabinet, as shown in fig. 10.
5. Tighten the two (2) screws (nos. 1 & 2) for the dial scale gear, as shown in fig. 10.

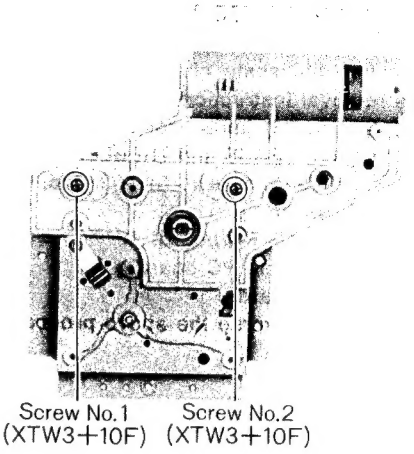


Fig. 6

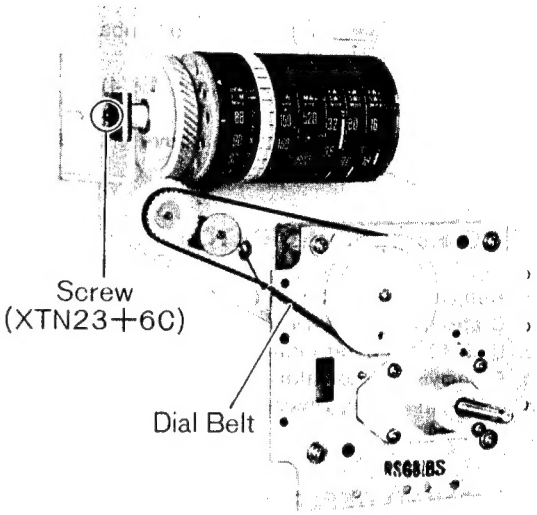


Fig. 7

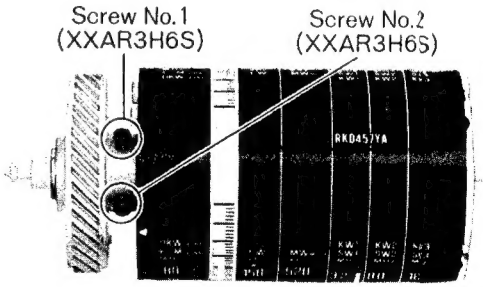


Fig. 8

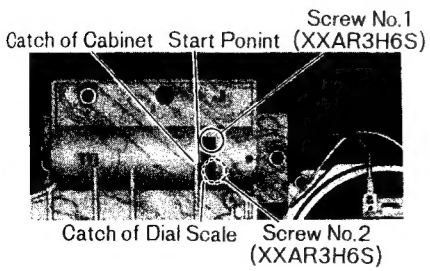


Fig. 10

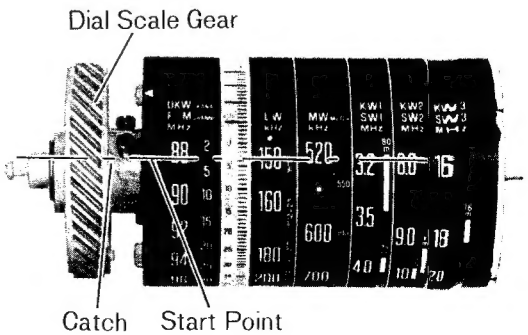


Fig. 9

■ TO REMOVE PC BOARD (AF Circuit)

1. Remove the dial scale chassis. (Refer to the dial scale chassis removal instruction.)
2. Remove the six (6) knobs for the RADIO, LIGHT, BAND WIDTH, VOLUME, BASS and TREBLE.
3. Remove the five (5) screws (nos. 2, 3, 5, 6 & 7) for the PC board, as shown in fig. 11.
4. Unsolder lead from PC board.
5. Pull out sockets from PC board.
6. Remove the PC board.
7. To reassemble, reverse the above procedure.

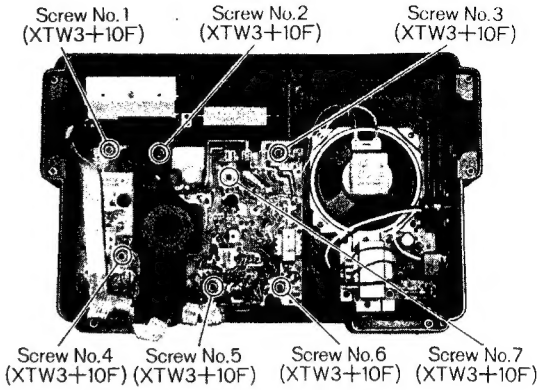


Fig. 11

■ TO REMOVE PC BOARD (Control Circuit)

1. Remove the dial scale chassis. (Refer to the dial scale chassis removal instruction.)
2. Remove the three (3) knobs for the SW CAL, RF GAIN and PITCH. (To remove those control knobs wind a cord around the control and pull it outward.)
3. Remove the two (2) screws (nos. 1 & 4) for the PC board.
4. Remove the PC board.
5. To reassemble, reverse the above procedure.

■ TO REMOVE INDICATOR

1. Remove the PC board (AF circuit). (Refer to PC board removal instruction.)
2. Unsolder the terminal of indicator, as shown in fig. 12.
3. Remove the indicator.
4. To reassemble, reverse the above procedure.

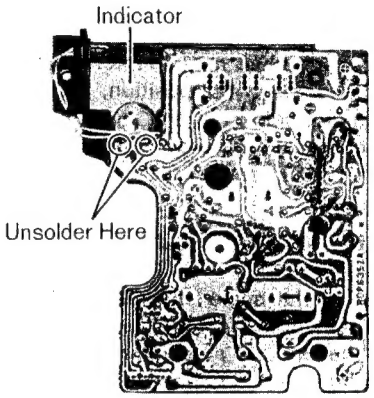


Fig. 12

■ HOW TO REPLACE CHIP

1. Remove solder for chip completely.
2. Remove chip by nippers, as shown in fig. 13.
3. Use tube for service parts as shown in fig. 14 and solder service parts according to following table. (please refer to Circuit Board Wiring View for the value of resistor and capacitor).

Color	Original Parts Name	Service Parts Name
Black	Chip Resistor	Carbon Resistor
Brown	Chip Capacitor	Ceramic Capacitor
Blue	Chip Jumper	Lead Wire

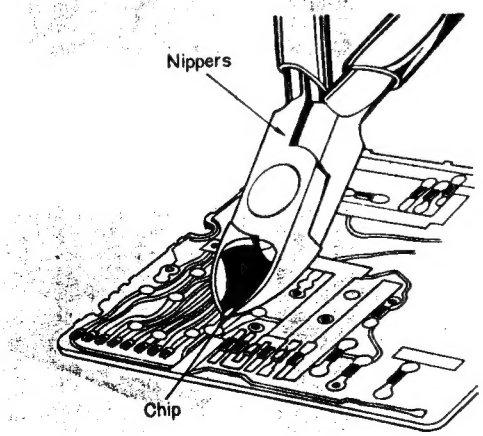


Fig. 13

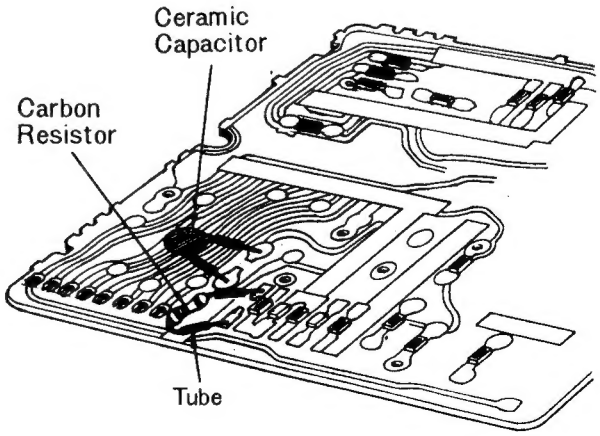


Fig. 14

■ BLOCK DIAGRAM

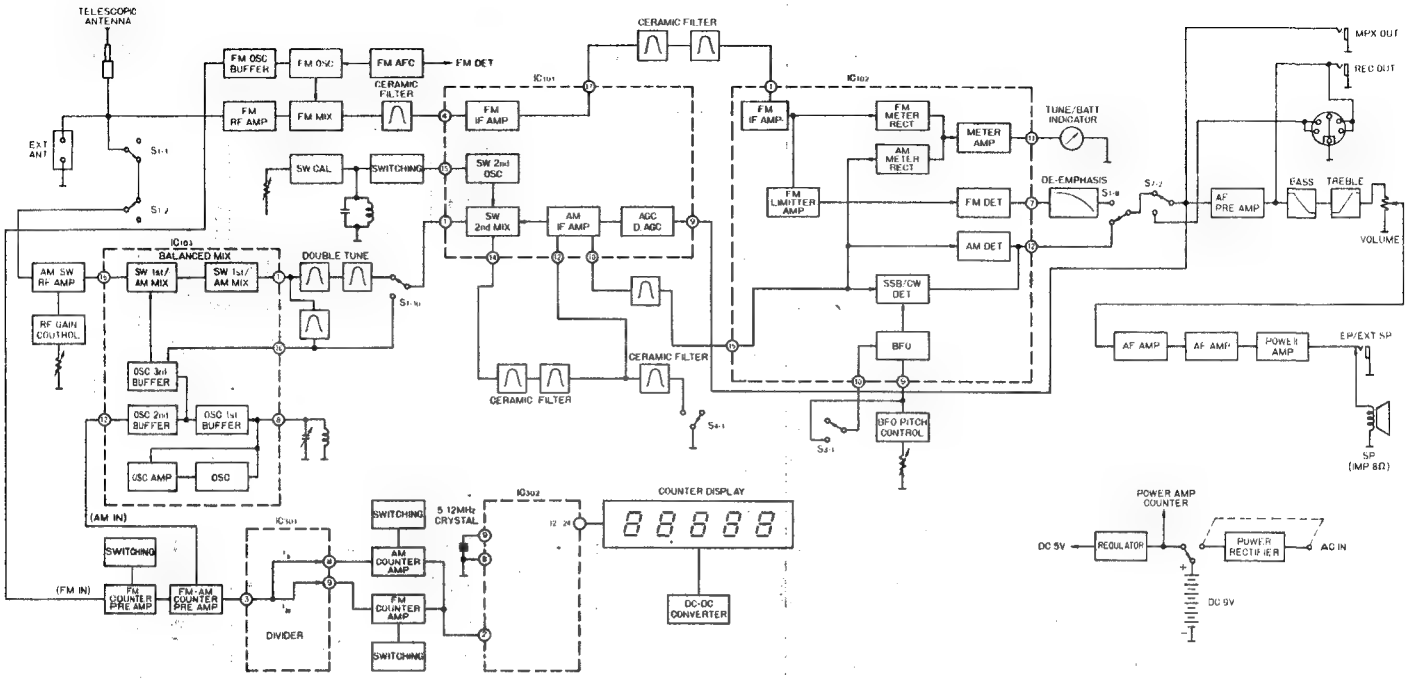


Fig. 15

■ ALIGNMENT POINTS

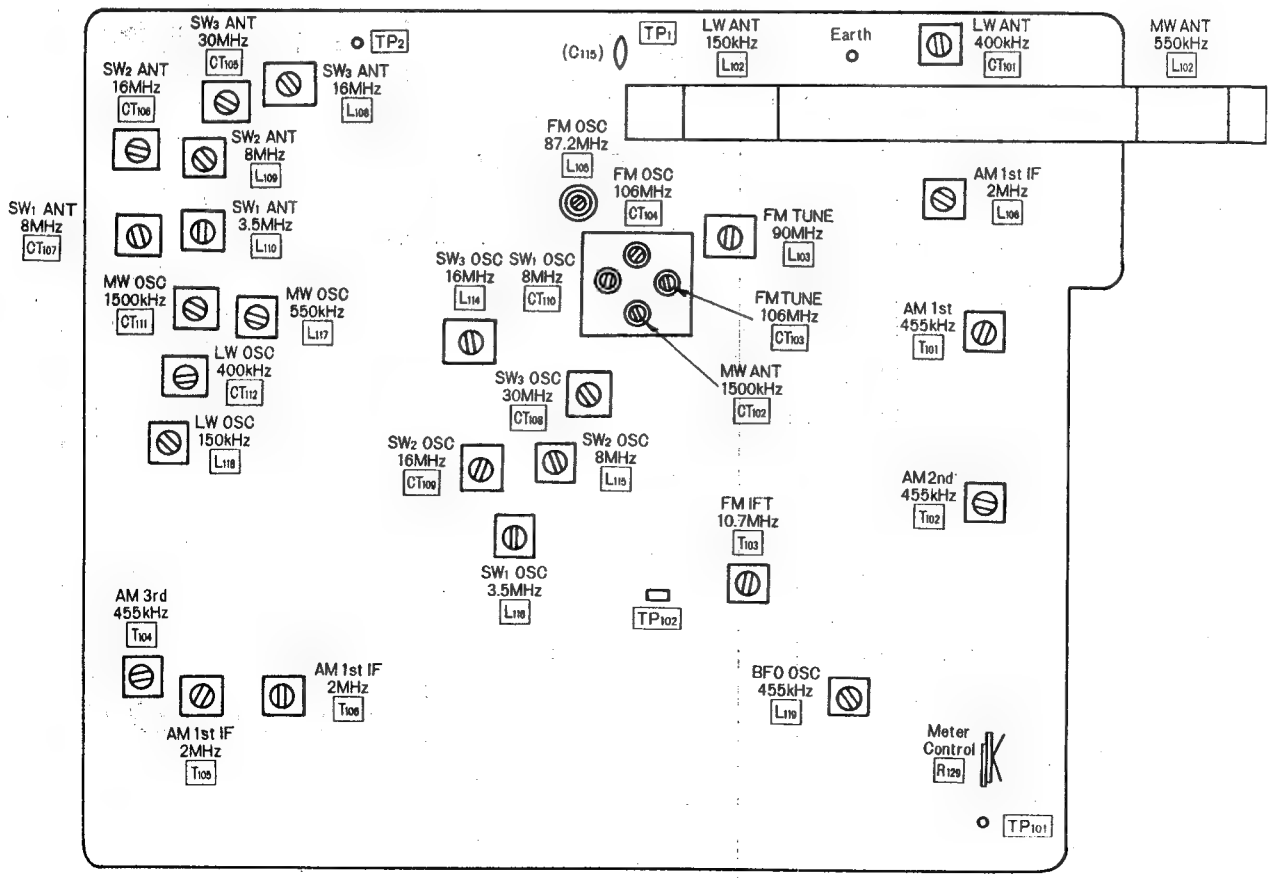


Fig. 16

■ ALIGNMENT INSTRUCTION

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

1. Set volume control to maximum.
2. Radio ON/OFF switch to ON.
3. Set bass and treble control to maximum.
4. Set band switch to MW, LW, SW or FM.
5. Set digital display switch to OFF position.
6. Set RF gain control to high.
7. Light switch to OFF position.
8. Set FM AFC/Band width switch to narrow, OFF position for the AM-IF, BFO, and FM adjustment, and to wide ON position for other adjustment.
9. Set pitch control to center.
10. Set BFO switch to ON position for BFO adjustment, and to OFF position for other adjustment.
11. Set SW Cal control to center.
12. Set power source voltage to 9V DC.
13. Output of signal generator should be no higher than necessary to obtain an output reading.

■ AM AND SW ALIGNMENT

	BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
		CONNECTIONS	FREQUENCY				
	AM-2nd IF ALIGNMENT						
(1)	AM	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz 30% Mod. at 400 Hz	Point of non-interference.	Output meter across voice coil.	T_{101} (AM 1st IFT) T_{102} (AM 2nd IFT) T_{104} (AM 3rd IFT)	Adjust for maximum output.
	LW-RF ALIGNMENT						
(2)	LW	〃	150 kHz	150 kHz (Refer to fig. 17)	Output meter across voice coil	L_{118} (LW OSC Coil) (＊) L_{102} (LW ANT Coil)	Adjust for maximum output. Adjust L_{102} by moving coil bobbin along ferrite core.
(3)	LW	〃	400 kHz	400 kHz (Refer to fig. 18)	〃	CT_{112} (LW OSC Trimmer) CT_{101} (LW ANT Trimmer)	Adjust for maximum output. Repeat steps (2) and (3).
	MW-RF ALIGNMENT						
(4)	MW	〃	550 kHz	550 kHz (Refer to fig. 19)	Output meter across voice coil	L_{117} (MW OSC Coil) (＊) L_{102} (MW ANT Coil)	Adjust for maximum output. Adjust L_{102} by moving coil bobbin along ferrite core.
(5)	MW	〃	1500 kHz	1500 kHz (Refer to fig. 20)	〃	CT_{111} (MW OSC Trimmer) CT_{102} (MW ANT Trimmer)	Adjust for maximum output. Repeat steps (4) and (5).
	(＊) Cement antenna bobbin with wax after completing alignment.						
	AM-1st IF ALIGNMENT						
(6)	SW_1	Connect to EXT ant. terminal through ceramic capacitor (10 PF). Negative side to earth	2 MHz	Point of non-interference.	〃	L_{106} (AM 1st IFT) T_{105} (AM 1st IFT) T_{106} (AM 1st IFT)	Adjust for maximum output.
	SW_1-RF ALIGNMENT						
(7)	SW_1	〃	3.5 MHz	3.5 MHz (Refer to fig. 21)	Output meter across voice coil.	L_{116}(SW_1 OSC Coil) L_{110}(SW_1 ANT Coil)	Adjust for maximum output.
(8)		〃	8.0 MHz	8.0 MHz (Refer to fig. 22)	〃	CT_{110} (SW_1 OSC Trimmer) CT_{107} (SW_1 ANT Trimmer)	Adjust for maximum output. Repeat steps (7) and (8).
	SW_2-RF ALIGNMENT						
(9)	SW_2	〃	8.0 MHz	8.0 MHz (Refer to fig. 23)	〃	L_{115}(SW_2 OSC Coil) L_{109}(SW_2 ANT Coil)	Adjust for maximum output.
(10)	SW_2	〃	16 MHz	16 MHz (Refer to fig. 22)	〃	CT_{109} (SW_2 OSC Trimmer) CT_{106} (SW_2 ANT Trimmer)	Adjust for maximum output. Repeat steps (9) and (10).
	SW_3-RF ALIGNMENT						
(11)	SW_3	〃	16 MHz	16 MHz (Refer to fig. 23)	〃	L_{114}(SW_3 OSC Coil) L_{108}(SW_3 ANT Coil)	Adjust for maximum ouptut.
(12)	SW_3	〃	30 MHz	30 MHz (Refer to fig. 24)	〃	CT_{108} (SW_3 OSC Trimmer) CT_{105} (SW_3 ANT Trimmer)	Adjust for maximum output. Repeat steps (11) and (12).

■ FM ALIGNMENT

	BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
		CONNECTIONS	FREQUENCY				
	FM-IF ALIGNMENT						
(1)	FM	Connect to test point **TP**$_1$ through 0.001μF. Negative side to earth.	10.7 MHz	Point of non-interference.	Connect vert. amp. of scope to test point **TP**$_{102}$. Negative side to earth.	T_{103} (FM IFT)	Adjust for maximum amplitude. (Refer to fig. 27)
	FM-RF ALIGNMENT						
(2)	FM	Connect to test point **TP**$_2$ through FM dummy antenna. (Refer to fig. 28).	87.2 MHz	Variable capacitor fully closed.	Output meter across voice coil.	L_{105} (FM OSC Coil)	(*) Adjust for maximum output.
(3)	FM	〃	90 MHz	90 MHz (Retor to fig. 25)	〃	L_{103} (FM TUNE Coil)	(*) Apjust for maximum output.
(4)	FM	〃	106 MHz	106 MHz (Refer to fig. 26)	〃	CT_{104} (FM OSC Trimmer) CT_{103} (FM TUNE Trimmer)	(*) Adjust for maximum output. Repeat stepe. (3)～(4)
	(*) Three output responses will be present; proper tuning is the center frequency.						

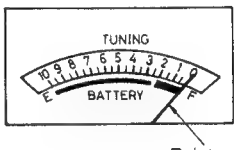
■ BFO ALIGNMENT

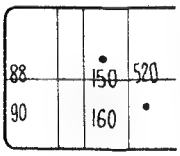
BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
BFO ALIGNMENT **Note:** Set band width switch to "Narrow".						
SW_1	Fashion loop of several turns of wire and radiate signal into loop of receiver.	3.5 MHz	Tune to signal.	Audio output from speaker.	L_{119} (BFO OSC Coil)	1. Cut off modulation after tune to signal. 2. Set BFO switch to ON. 3. Adjust for zero beat.

■ TUNE/BATT METER ADJUSTMENT

1. RADIO RECEIVER SETTING
   - Set band switch to AM.
   - Set volume control MIN.
   - Set switch to.
   - Set BFO switch to OFF.
   - Set power source voltage to 9 volts DC.

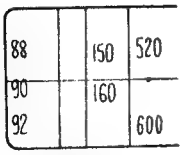
2. REMARKS
   - Adjust R_{129} so that the pointer of meter stays as shown in figure right.





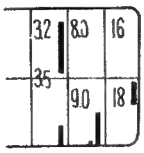
LW (150 kHz)

Fig. 17



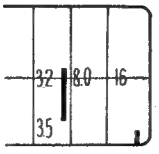
MW (550 kHz)

Fig. 19



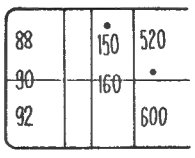
SW_1 (3.5 MHz)

Fig. 21



SW_2 (8 MHz)
SW_3 (16 MHz)

Fig. 23



FM (90 MHz)

Fig. 25

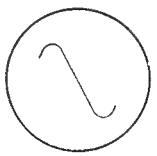
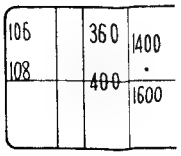
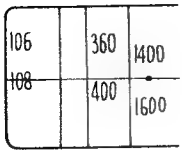


Fig. 27



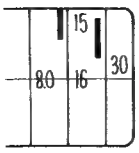
LW (400 kHz)

Fig. 18



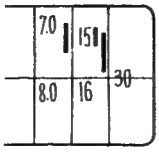
MW (1500 kHz)

Fig. 20



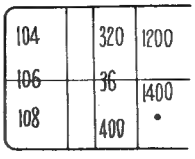
SW_1 (8 MHz)
SW_2 (16 MHz)

Fig. 22



SW_3 (30 MHz)

Fig. 24



FM (106 MHz)

Fig. 26

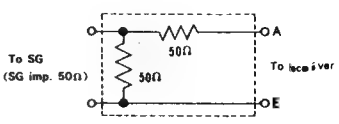
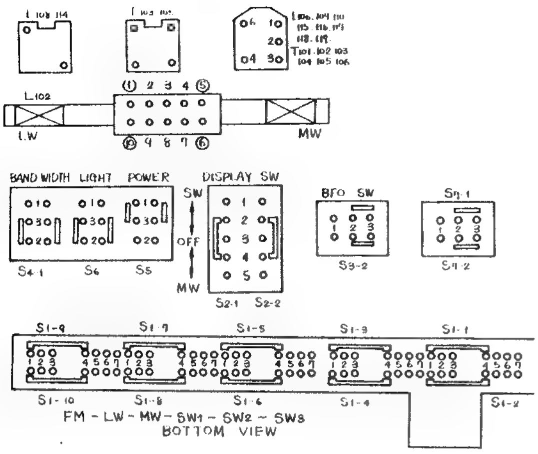
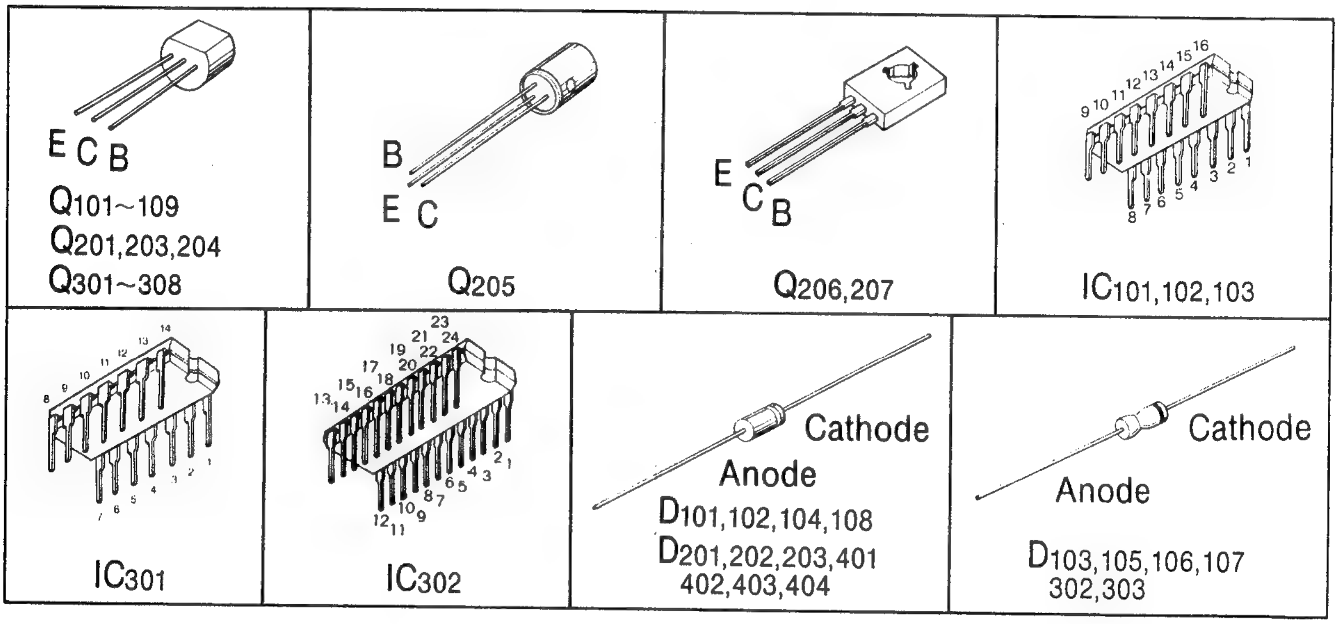


Fig. 28



Notes:

1. S_{1-1}~S_{1-10}: Band switch in "FM" position.
2. S_{2-1}, S_{2-2}: Digital display switch in "OFF" position.
3. S_{3-1}, S_{3-2}: BFO switch in "OFF" position.
4. S_{4-1}: Band width switch in "NARROW" position.
5. S_5: Radio ON/OFF switch in "OFF" position.
6. S_6: Light switch in "OFF" position.
7. S_7: Phono/Radio switch in "Radio" position.
8. S_8: Voltage selector switch.
9. DC voltage measurements are taken with 10 kΩ/V voltmeter from negative terminal of battery.
   ☐......FM position ( )...........AM position
   〈 〉...........SW position
10. o mark......chip resistor and capacitor.
11. Battery current. No signal ....36 mA
    Maximum output ....600 mA



■ VOLTAGE

Q 101

	FM
D	3.3V
G	0V
S	0V
Is	3.5mA

Q 102

	FM	AM
C	4.8V	0V
B	1.47V	0V
E	0.85V	0V

Q 103

	FM
C	0V
B	1.2V
E	2.1V
Ie	0.4mA

Q 104

	FM
C	0V
B	3.5V
E	4.4V
Ie	0.8mA

Q 105

	FM	AM	SW
C	0.66V	4.45V	4.45V
B	0.18V	3.7V	4.15V
E	0.66V	4.45V	4.45V

Q 106

	FM	AM	SW
C	0.2V	0.12V	4.2V
B	0.63V	0.63V	0.1V
E	0V	0V	0V

Q 107

C	8.6V
B	1.8V
E	2.4V
Ie	0.67mA

Q 108

	FM	AM
D	0V	2.1V
G	0V	0V
S	0V	0V
Is	2.3mA	2.3mA

Q 109

	FM	AM
C	0.7V	5.2V
B	0.4V	2.7V
E	0V	2.1V
Ie	2.3mA	2.3mA

Q 201

C	8.3V
B	5.4V
E	5.3V

Q 202

C	5.3V
B	8.3V
E	9V

Q 203

C	2.3V
B	0.3V
E	0.07V

Q 204

C	1.95V
B	0.38V
E	0.43V
Ie	1.2mA

Q 205

C	0.25V
B	3.5V
E	3.75V

Q 206, 207

C	9V
B	0.64V
E	0V

Q 901

	FM	SW
C	4.8V	0.17V
B	1.25V	0.85V
E	0.56V	0.17V

Q 902

	FM	SW
C	3.5V	0.34V
B	0.53V	0.53V
E	0.56V	0.17V

Q 903

C	4V
B	0.06V
E	0V

Q 904

	FM	SW
C	4.8V	0.17V
B	4.2V	4.3V
E	4.9V	4.9V

Q 905

	FM	SW
C	4.9V	4.9V
B	4.3V	4.3V
E	4.9V	4.9V

Q 906

	FM	SW
C	4.9V	4.9V
B	0V	4.2V
E	4.2V	4.3V

Q 907

	FM	SW
C	2.5V	3.35V
B	4.2V	4.3V
E	4.9V	4.9V

Q 908

	FM	SW
C	2.5V	3.35V
B	4.9V	4.9V
E	4.9V	4.9V

IC 101

	FM	AM		FM	AM
1	0.15V	0.7V	9	0V	0.3V
2	0.15V	0.7V	10	0.7V	4.7V
3	0V	0V	11	1.7V	2.6V
4	3.6V	0V	12	0.3V	0.9V
5	3.6V	0V	13	0.7V	4.4V
6	4.9V	0V	14	0.7V	4.4V
7	3.7V	0V	15	0.7V	4.4V
8	0V	0V	16	0.3V	3.7V

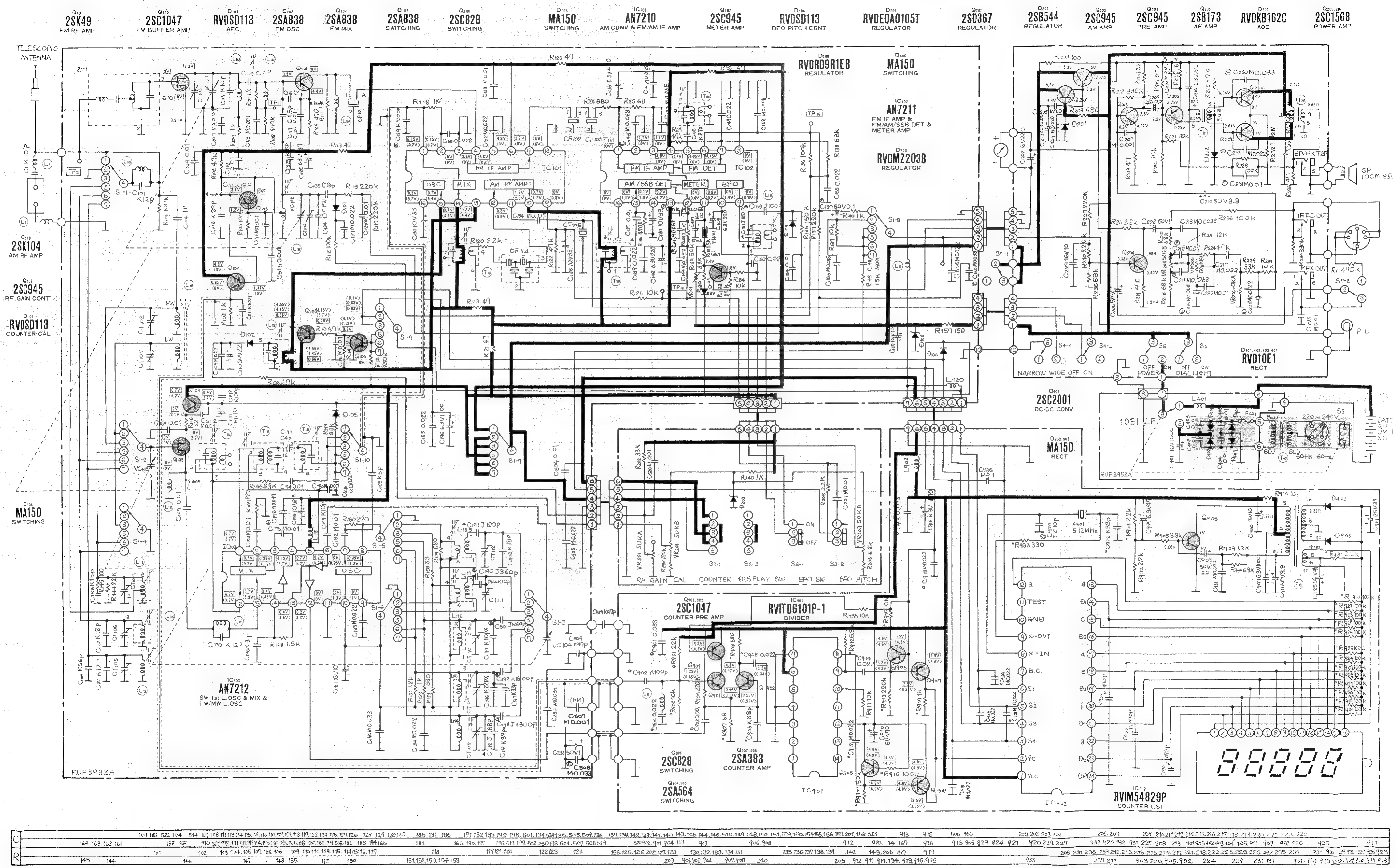
IC 102

	FM	AM		FM	AM
1	1.1V	0V	9	0V	0.6V
2	1.1V	0V	10	0V	1.4V
3	1.1V	0V	11	0.9V	0.7V
4	4.9V	0V	12	0V	0.4V
5	1.4V	0V	13	0.7V	4.7V
6	4.05V	0V	14	0.1V	1.3V
7	4.15V	0V	15	0V	1.1V
8	0V	0V	16	0V	0V

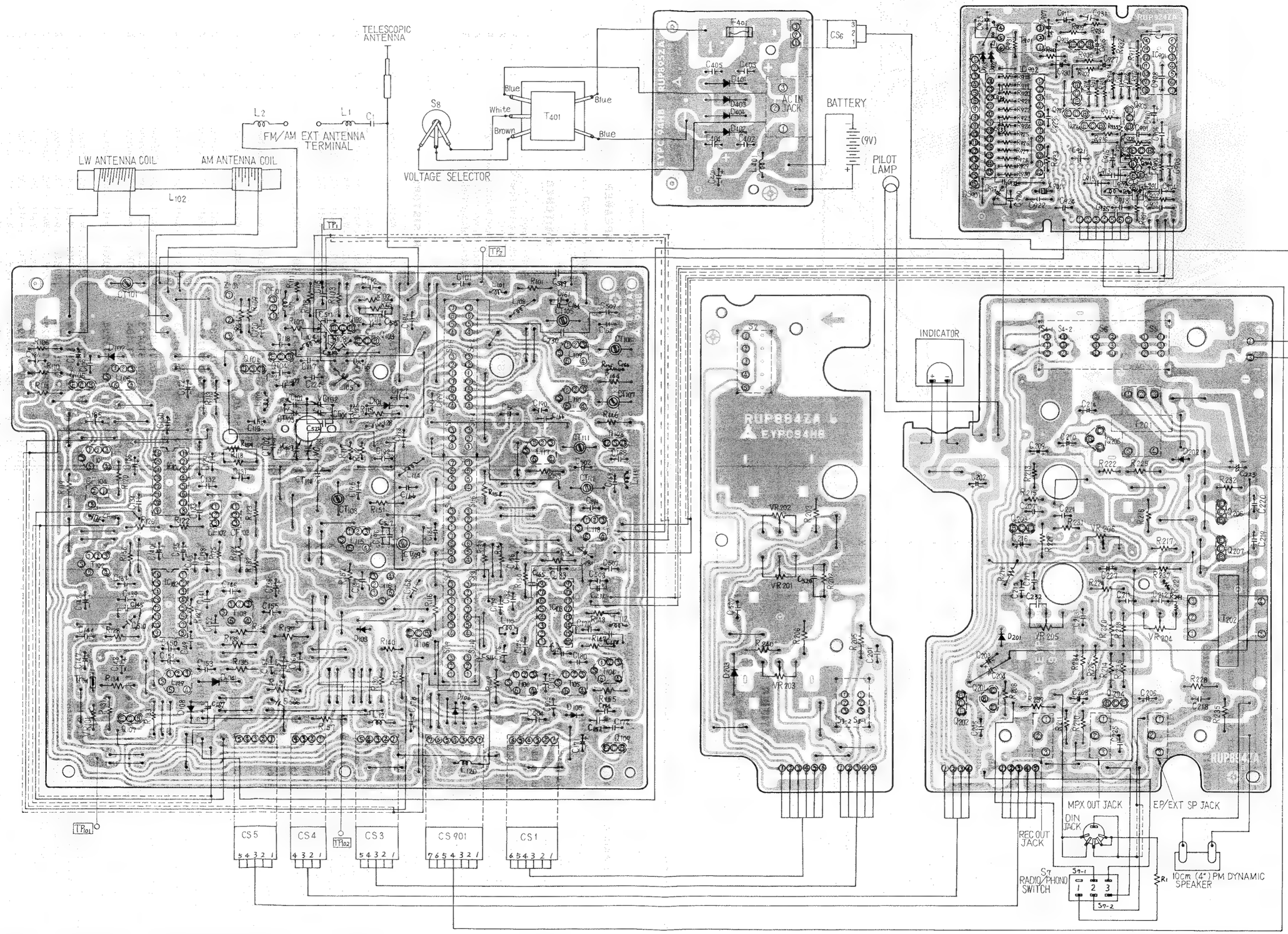
IC 103

	FM	AM		FM	AM
1	0.7V	5.2V	9	0V	1V
2	0.7V	5.2V	10	0V	1.3V
3	0.35V	4.6V	11	0V	0V
4	0.15V	3.7V	12	0.2V	3.7V
5	0.7V	5.2V	13	0.4V	4.5V
6	0.7V	5.2V	14	0.4V	4.45V
7	0V	0.95V	15	0.7V	5.2V
8	0.05V	1.3V	16	0.7V	5.2V

Schematic Diagram – Model RF-2800LBS



Circuit Board Wiring View – Model RF-2800LBS



Q, D & IC	Q105 D102 Q107 IC101 IC102 D108 D104 Q101 Q104	Q102 D103 Q103 D101 Q106 D106	T401 IC103 D105 Q108 Q109	D401 D402 D403 D404 D203	Q904 IC902 D902 D903 Q201 D201 Q203 Q903 Q908 Q907 Q906 Q905 Q206 Q905 D202 IC901 Q902 Q903 Q206 Q207
T & L	T101 T102 L106 L119 L102 T103 L2 L103 L107 L104	L105 L115 L116 L121 L1 L114 L120	L101 L113 T106 L108 T401 L117 L109 L110 T105 L118 T104 L112 L111	L401	T901 L902 T201 L901 T202

■REPLACEMENT PARTS LIST····· Model RF-2800LBS

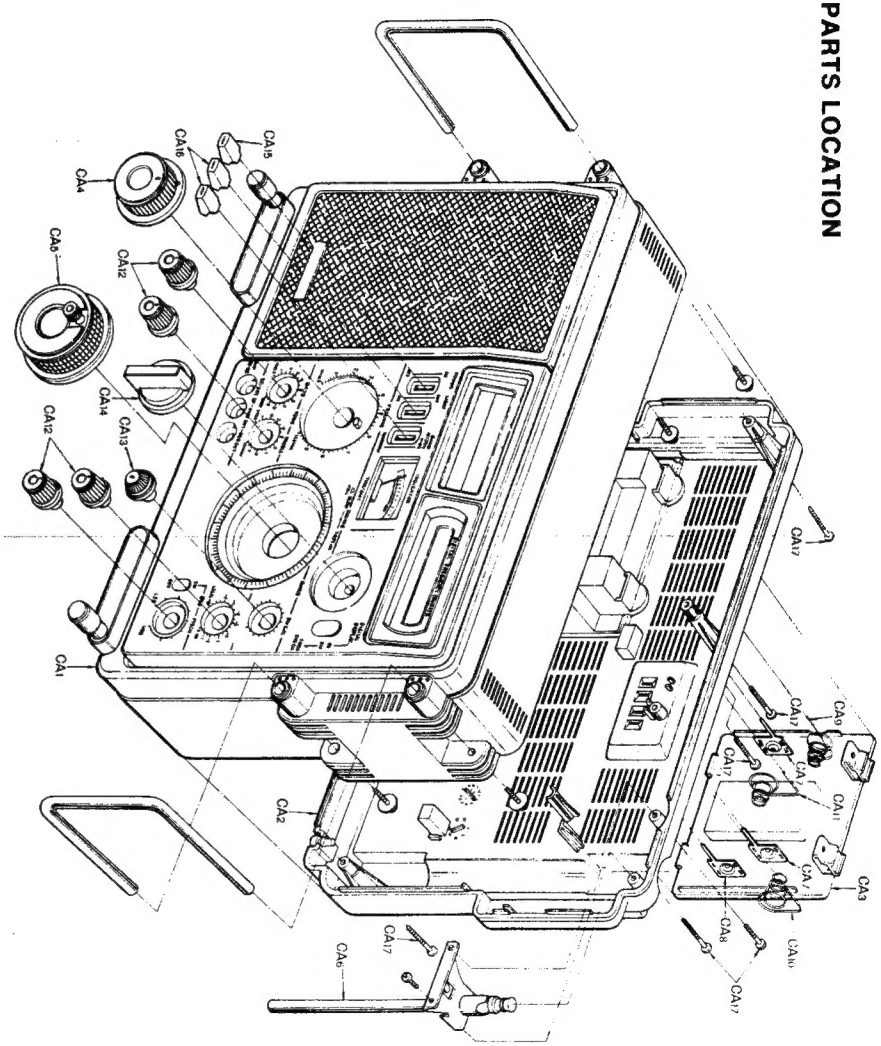
(RD7803-1549)

NOTES: 1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.
2. **X**−**Z** rank : **X** rank parts will cover 80% of repair needs.
X+**Y** rank parts will cover 95% of repair needs.
Z rank parts are less necessary.
3. Components identified by shaded area have special characteristic important for safety.
When replacing any of these components use only manufacturer's specified parts.
4. Part numbers shown in bold letters are service standard parts and may differ from production parts.
5. The ○ mark is used by the manufacturing plant only.

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
INTEGRATED CIRCUITS, TRANSISTORS AND DIODES					
IC101	AN7210	IC, FM/AM IF Amp.	1		○X
IC102	AN7211	IC, FM IF/Detector, AM, SSB Detector	1		○X
IC103	AN7212	IC, SW 1st L.Oscillator, Mix, LW/MW L.Oscillator	1		○X
IC901	RVITD6101P-1	IC, Divider	1		○X
IC902	RVIM54829P	IC, Counter LSI	1		○X
Q101	2SK49	Transistor (Si), FM RF Amp.	1		X
Q102,901,902	2SC1047	Transistor (Si), Buffer Amp., Counter Pre Amp.	3		X
Q103,104,105 907,908	2SA838	Transistor (Ge), FM Oscillator, Mix, Switching, Counter Amp.	5		X
Q106,906	2SC828	Transistor (Si), Switching	2		X
Q107,109,203 204	2SC945	Transistor (Si), Meter Amp., RF Gain Control, Pre Amp., AF Amp.	4		X
Q108	2SK104	Transistor (Si), Regulator	1		X
Q201	2SD367	Transistor (Si), Regulator	1		X
Q202	2SB544	Transistor (Ge), Regulator	1		X
Q205	2SB173	Transistor (Ge), AF Amp.	1		X
Q206,207	2SC1568	Transistor (Si), AF Amp.	1		X
Q903	2SC2001	Transistor (Si), Oscillator, Power Amp.	1		X
Q905,904	2SA564	Transistor (Ge), Switching	2		X
D101,102,104	**RVDSD113**	Diode (Si), AFC, Counter Cap., BFO Pitch Control	3		X
D103,105,106 902,903	**MA161**	Diode (Si), Switching, Rectifier	5		X
D108	**RVDWZ094**	Diode (Si), Regulator	1		X
D201	RVDEQA0105T	Diode (Si), Regulator	1		○X
D202	RVDKB162C	Diode (Si), Operation Compensator	1		X
D203	**RVDMZ203B**	Diode (Si), Regulator	1		X
D401,402,403 404	**SM112**	Diode (Si), Rectifier	4		X
RECTIFIER					
Th101	RRT800	Thermistor, Temperature Compensator	1		X

Fig. 29

■ CABINET PARTS LOCATION



Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
CERAMIC FILTERS, COILS AND TRANSFORMERS					
CF101,102, 103	RVFCF10S12FR	Ceramic Filter	3		X
CF104	RVFLFB6A	Ceramic Filter	1		OX
CF105	RVFBFB455C2	Ceramic Filter	1		OX
L102	RLF6F20	Antenna Coil, MW, LW	1		OX
L103	RLD4M9	Tuning Coil, FM	1		OX
L105	RLO4N105	Oscillator Coil, FM	1		OX
L106	RLO9M10	IFT, AM 1st IF	1		OX
L108	RLD7M3	Antenna Coil, SW3	1		OX
L109	RLA3M30	Antenna Coil, SW2	1		OX
L110	RLA3M40	Antenna Coil, SW1	1		OX
L114	RLD4M5	Oscillator Coil, SW3	1		OX
L115	RLO3M49	Oscillator Coil, SW2	1		OX
L116	RLO3M48	Oscillator Coil, SW1	1		OX
L117	RLO2M14	Oscillator Coil, MW	1		OX
L118	RLO1M8	Oscillator Coil, LW	1		OX
L119	RLO9M9	Oscillator Coil, BFO	1		OX
T101	RLI2M212	IFT, AM 2nd IF	1		X
T102	**RLI2M205**	IFT, AM 2nd IF	1		X
T103	**RLI4M101**	IFT, FM	1		X
T104	**RLI2M204**	IFT, AM 2nd IF	1		X
T105	**RLI9M3**	IFT, AM 1st IF	1		X
T106	**RLI9M4**	IFT, AM 1st IF	1		X
T201	**RLT3F30**	Input Transformer, P=700Ω:S=1KΩ	1		X
T202	**RLT2H28**	Output Transformer, P=45Ω:S=8Ω	1		X
T901	RLT9E2	Power Transformer, Time Display	1		OX
T401	**RLT5K118**	**Power Transformer**	1		OX
VARIABLE RESISTORS					
VR201,205, 206	EVHOXAF15A54	Variable Resistor, 50KΩ (A), RF Gain, Treble, Volume	3		X
VR202,203, 204	EVHOXAF15B54	Variable Resistor, 50KΩ (B), SW Cal, BFO Pitch, Bass	3		X
VR101	**EVLT4AA00B54**	Preset, 50KΩ (B), Meter	1		X
VARIABLE CAPACITORS					
CV101,102, 103,104	PVC22K20T5L	Tuning Capacitor, W/Trimmer Capacitor (CT102,103,104,110)	1		Y
CT107,111	RCV1PX10AGS	Trimmer Capacitor	2		Y
CT101	RCV1PX15AGS	Trimmer Capacitor	1		Y
CT112	RCV1PX20AGS	Trimmer Capacitor	1		Y
CT105,106, 108,109	RCV1PX30AGS	Trimmer Capacitor	4		Y
COMPONENT COMBINATION AND CRYSTAL					
Z101	RXABPMF1	Component Combination	1		Y
X901	RVCX5120N5Z	Crystal	1		OX

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
SPEAKER					
SP	EAS10P57SC	Speaker, Imp. 32Ω, 10cm(4"), PM Dynamic	1		OX
SWITCHES					
S1-1~S1-10	RSR6J01Z-H	Switch, Band	1		OX
S2-1, S2-2	RSS69Z-M	Switch, Digital Display	1		OX
S3-1, S3-2	RSS2B03Z-H	Switch, BFO	1		OX
S4-1, S5, S6	RSTX003Y-A	Switch, Band Width, Power, Light	1		OX
S7	RSS2B02Z-H	Switch, Phono/Radio	1		X
S8	RSR2A01Z-H	Switch, Voltage Selector	1		X
RESISTORS					
R113,119,121 123,132	**ERD25TJ470**	47Ω, ¼Watt, ±5%, Carbon	5		Z
R239,145	**ERD25TJ101**	100Ω, ¼Watt, ±5%, Carbon	2		Z
R118,147,150	**ERD25TJ221**	220Ω, ¼Watt, ±5%, Carbon	3		Z
R153	**ERD25TJ331**	330Ω, ¼Watt, ±5%, Carbon	1		Z
R109,225	**ERD25TJ471**	470Ω, ¼Watt, ±5%, Carbon	2		Z
R124,208 154	**ERD25TJ681**	680Ω, ¼Watt, ±5%, Carbon	2		Z
R107,103,104 111,140,240 514	**ERD25TJ102**	1KΩ, ¼Watt, ±5%, Carbon	9		Z
R131,148 215	**ERD25TJ152**	1.5KΩ, ¼Watt, ±5%, Carbon	3		Z
R120,128,205 211,932	**ERD25TJ222**	2.2KΩ, ¼Watt, ±5%, Carbon	5		Z
R149,905	**ERD25TJ332**	3.3KΩ, ¼Watt, ±5%, Carbon	2		Z
R102,106,110 127,224	**ERD25TJ472**	4.7KΩ, ¼Watt, ±5%, Carbon	5		Z
R114,126,134 139,231	**ERD25TJ103**	10KΩ, ¼Watt, ±5%, Carbon	5		Z
R143,221	**ERD25TJ333**	33KΩ, ¼Watt, ±5%, Carbon	2		Z
R122	**ERD25TJ473**	47KΩ, ¼Watt, ±5%, Carbon	1		Z
R101,105,112 136,226,228	**ERD25TJ104**	100KΩ, ¼Watt, ±5%, Carbon	6		Z
R115,117,137 210,237	**ERD25TJ224**	220KΩ, ¼Watt, ±5%, Carbon	5		Z
R116,212,234	**ERD25TJ334**	330KΩ, ¼Watt, ±5%, Carbon	3		Z
R1,108,156	**ERD25TJ474**	470KΩ, ¼Watt, ±5%, Carbon	3		Z
R133	**ERD25TJ273**	27KΩ, ¼Watt, ±5%, Carbon	1		Z
R146	**ERD25TJ220**	22KΩ, ¼Watt, ±5%, Carbon	1		Z
R151,909	**ERD25TJ122**	1.2KΩ, ¼Watt, ±5%, Carbon	2		Z
R130,155	**ERD25TJ392**	3.9KΩ, ¼Watt, ±5%, Carbon	2		Z
R138,236	**ERD25TJ683**	68KΩ, ¼Watt, ±5%, Carbon	2		Z
R206,218,220 934	**ERD25TJ682**	6.8KΩ, ¼Watt, ±5%, Carbon	4		Z
R216,143	**ERD25TJ153**	15KΩ, ¼Watt, ±5%, Carbon	2		Z
R213,235	**ERD25TJ470**	47Ω, ¼Watt, ±5%, Carbon	2		Z
R202,229	**ERD25TJ333**	33KΩ, ¼Watt, ±5%, Carbon	2		Z
R135,234	**ERD25TJ154**	150KΩ, ¼Watt, ±5%, Carbon	2		Z

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
R203	**ERD25TJ124**	120KΩ, ¼Watt, ±5%, Carbon	1		Z
R910	**ERD25TJ100**	10Ω, ¼Watt, ±5%, Carbon	1		Z
R214	**ERD25TJ471**	470Ω, ¼Watt, ±5%, Carbon	1		Z
R125,222	**ERD25TJ680**	68Ω, ¼Watt, ±5%, Carbon	2		Z
R217	**ERD25TJ272**	2.7KΩ, ¼Watt, ±5%, Carbon	1		Z
R232	**ERX1ANJ1RO**	1Ω, 1Watt, ±5%, Metal	1		Z
R907	RRD18XK680	68Ω, ⅛Watt, ±10%, Chip	1		Z
R933	RRD18XK331	330Ω, ⅛Watt, ±10%, Chip	1		Z
R908	RRD18XK681	680Ω, ⅛Watt, ±10%, Chip	1		Z
R917	RRD18XK102	1KΩ, ⅛Watt, ±10%, Chip	1		Z
R903,931	RRD18XK222	2.2KΩ, ⅛Watt, ±10%, Chip	2		Z
R912	RRD18XK682	6.8KΩ, ⅛Watt, ±10%, Chip	1		Z
R902,911,915	RRD18XK103	10KΩ, ⅛Watt, ±10%, Chip	3		Z
R901	RRD18XK223	22KΩ, ⅛Watt, ±10%, Chip	1		Z
R916,918,919 920,921,922 925,926,927 928,929,930 923,924	RRD18XK104	100KΩ, ⅛Watt, ±10%, Chip	14		Z
R914	RRD18XK154	150KΩ, ⅛Watt, ±10%, Chip	1		Z
R904,913	RRD18XK224	220KΩ, ⅛Watt, ±10%, Chip	2		Z
R158	**ERD25TJ330**	33Ω, ¼Watt, ±5%, Carbon	1		Z
R157	**ERD25TJ151**	150Ω, ¼Watt, ±5%, Carbon	1		Z
R144	**ERD25TJ223**	22KΩ, ¼Watt, ±5%, Carbon	1		Z
R241	**ERD25TJ123**	12KΩ, ¼Watt, ±5%, Carbon	1		Z
		CAPACITORS			
C104	ECCD1H010C	1PF, 50WV,±0.25PF,Ceramic	1		Z
C177,118	ECCD1H040C	4PF, 50WV,±0.25PF,Ceramic	2		Z
C1,113,166, 179	ECCD1H100KC	10PF, 50WV,±10%, Ceramic	4		Z
C101,111,161 170	ECCD1H120KC	12PF, 50WV,±10%, Ceramic	4		Z
C163	ECCD1H150KC	15PF, 50WV,±10%, Ceramic	1		Z
C162	ECCD1H180KC	18PF, 50WV,±10%, Ceramic	1		Z
C146,502	ECCD1H270KC	27PF, 50WV,±10%, Ceramic	2		Z
C161,172,511	ECCD1H101K	100PF, 50WV,±10%, Ceramic	3		Z
C117	ECCD1H1R5C	1.5PF, 50WV,±0.25PF,Ceramic	1		Z
C517	ECCD1H330KC	33PF, 50WV,±10%, Ceramic	1		Z
C108	ECCD1H390KC	39PF, 50WV,±10%, Ceramic	1		Z
C195	ECCD1H330KU	33PF, 50WV,±10%, Ceramic	1		Z
C196	ECCD1H220KX	22PF, 50WV,±10%, Ceramic	1	○	Z
C197	ECCD1H100KX	10PF, 50WV,±10%, Ceramic	1	○	Z
C124	ECCD1H070DW	7PF, 50WV,±0.5PF, Ceramic	1		Z
C107,115,116 152,207,326 507	ECKD1H102MD	0.001μF, 50WV,±20%, Ceramic	8		Z
C109,112,120 128,134,137 154,168,169 174,402,403 404,405,504	ECKD1H103PF	0.01PF, 50WV,±$^{100}_{0}$%, Ceramic	13		Z
C126,133,173 158,175,180 182,201,205 225,520,521	ECKD1H103MD	0.01μF, 50WV,±20%, Ceramic	12		Z

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
C139,149,150 185	ECKD1H223PF	0.022μF, 50WV,±$^{100}_{0}$%, Ceramic	4		Z
C515	ECKD1H102PF	0.002μF, 50WV,±$^{100}_{0}$%, Ceramic	1		Z
C516	ECKD1H222MD	0.0022μF,50WV,±20%, Ceramic	1		Z
C156	ECKD1H153MD	0.015μF, 50WV,±20%, Ceramic	1		Z
C127,132,141 144,183,184 505,506	ECKD1H223MD	0.022μF, 50WV,±20%, Ceramic	8		Z
C213	ECKD1H332MD	0.0033μF,50WV,±20%, Ceramic	1		Z
C160,220 508	ECFVD333MD	0.033μF, 25WV,±20%, Semi-Conductor	3		Z
C176	ECFVD473MD	0.047μF, 25WV,±20%, Semi-Conductor	1		Z
C138,143,211 215	ECFVD683MD	0.068μF, 25WV,±20%, Semi-Conductor	4		Z
C212,218,232	ECFVD103MD	0.01μF, 25WV,±20%, Semi-Conductor	3		Z
C217,219,221 931	ECFVD223MD	0.022μF, 25WV,±20%, Semi-Conductor	4		Z
C153	ECMS05101JH	100PF, 50WV,±5%, Mica	1		Z
C151,191	ECMS05121JH	120PF, 50WV,±5%, Mica	2		Z
C192	ECMS05680JH	68PF, 50WV,±5%, Mica	1		Z
C190	ECQS05361JZ	360PF, 50WV,±5%, Styrol	1		Z
C129	ECQS05102KZ	1000PF, 50WV,±10%, Styrol	1		Z
C199	ECQS05182KZ	1800PF, 50WV,±10%, Styrol	1		Z
C198	ECQS05432JZ	4300PF, 50WV,±5%, Styrol	1		Z
C145,510	ECQG05683MZ	0.068μF, 50WV,±20%, Styrol	2		Z
C186,210	**ECEA1AS101**	100μF, 10WV, Electrolytic	2		Y
C122,927	**ECEA1AS470**	47μF, 10WV, Electrolytic	2		Y
C142,148,202 203,204,214	**ECEA1AS221**	220μF, 10WV, Electrolytic	6		Y
C136,910,916	**ECEA0JS471**	470μF, 6.3WV, Electrolytic	3		Y
C130,135,140 178	**ECEA1CS330**	33μF, 16WV, Electrolytic	4		Y
C147,167,171 181	**ECEA1HS100**	10μF, 50WV, Electrolytic	4		Y
C110,905,209	**ECEA2AS2R2**	2.2μF, 100WV, Electrolytic	3		Y
C216,911	**ECEA2AS3R3**	3.3μF, 100WV, Electrolytic	2		Y
C206,208,231	**ECEA2AS010**	1μF, 100WV, Electrolytic	3		Y
C223,401	**ECEA1HS102**	1000μF, 50WV, Electrolytic	2		Y
C227,930	**ECEA1CS100**	10μF, 16WV, Electrolytic	2		Y
C907	**ECEA0JS102**	1000μF, 6.3WV, Electrolytic	1		Y
C925	**ECEA1JS4R7**	4.7μF, 6.3WV, Electrolytic	1		Y
C917	**ECEA1VS330**	33μF, 35WV, Electrolytic	1		Y
C920	ECQS05271JZ	270PF, 50WV,±5%, Styrol	1		Z
C922	ECUX1H330KC	33PF, 50WV,±10%, Chip	1		Z
C906	ECUX1H680KC	68PF, 50WV,±10%, Chip	1		Z
C902	ECUX1H101KD	100PF, 50WV,±10%, Chip	1		Z
C903	ECUX1H102ZF	0.001μF, 50WV,±$^{80}_{20}$%, Chip	1		Z
C903,908,914	ECUX1H223ZF	0.022μF, 50WV,±$^{80}_{20}$%, Chip	8		Z
C912,915,918 921,923,924	ECUX1H223MD	0.022μF, 50WV,±20%, Chip	6		Z
C901,913	ECUX1H333ZF	0.033μF, 50WV,±$^{80}_{20}$%, Chip	2		Z
C165,522	ECCD1H050CC	5PF, 50WV,±0.25PF,Ceramic	2		Z
C509,519	ECCD1H470KC	47PF, 50WV,±10%, Ceramic	2		Z
C164	ECCD1H680K	68PF, 50WV,±10%, Ceramic	1		Z
C501	ECQS05681JZ	680PF, 50WV,±5%, Styrol	1		Z
C932,934,933	ECKD1H471KB	470PF, 50WV,±10%, Ceramic	3		Z
C935	ECFVD104MD	0.1μF, 25WV,±20%, Semi-Conductor	1		Z

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
C157	**ECEA50VR1**	0.1μF, 50WV, Electrolytic	1		Z
C188	ECKD1H030C	3PF, 50WV, ±0.25PF, Ceramic	1		Z
		CABINET			
CA1	RYMF2800LBSX	Cabinet Assembly	1		○X
CA2	RYFF2800LBSX	Cabinet Cover Assembly	1		○X
CA2	RYFF2800LBSI	Cabinet Cover Assembly,For Italy	1		○X
CA3	RYNF2800M	Battery Cover Assembly	1		○X
CA4	RYT1F2800N	Knob Assembly,Volume	1		○X
CA5	RYT2F2800N	Knob Assembly,Tuning	1		○X
CA6	XEART160GE-Y	Telescopic Antenna,7 Steps,960mm	1		○X
	RJF1065Z	Terminal	2		○X
CA7	RJC205B	Terminal,Battery ⊕ Side	2		Y
CA8	RJC111A	Terminal,Battery ⊕ Side	1		Y
CA9	RJC505Z	Terminal Spring,Battery ⊖ Side	1		Y
CA10	RJC508Z	Terminal Spring,Battery ⊖ Side	1		○Y
CA11	RJC509Z	Terminal Spring,Battery ⊖ Side	1		○Y
CA12	RBN381Z	Knob,Bass,Treble,Pitch and etc.	4		○Y
CA13	RBN420Z	Knob,SW Cal.	1		○Y
CA14	RBS112Z	Knob,Band	1		○Y
CA15	RBE13Y	Knob,Power	1		○Y
CA16	RBE13X	Knob,Light,FM AFC	2		○Y
	RHG316A	Foot,Cabinet	2		Z
	RHG886Y	Rubber,Speaker	1		○Z
CA17	XTN3+25C	Screw,Cabinet Cover M'tg	6		Z
		CHASSIS			
CH1	RSG8ZS	Dial Mechanism Assembly	1		○X
CH2	RYDF2800LBSX	Dial Scale Assembly	1		○X
CH3	RXEF2800M	Dial Scale Chassis Assembly	1		○X
CH4	XBA2C08TRO	Fuse,250V,800mA	1		X
	RAD5-BT-11	Frequency Display	1		○X
CH5	XAMR43S100A	Pilot Lamp,9V,60mA	1		X
CH6	RSM2616Z-K	Meter,Tune/Battery	1		○X
CH7	RJJ115Z-H	Jack,AC IN	1		Y
CH8	RJF7A	Holder,Fuse	2		Z
	RJS31-1	Socket,Din	1		Y
	RUS323Z	Spring,Dial Gear	1		○Z
	RUS295Z	Spring,Dial Drum	1		○Z
CH9	RUV426Z	Cover,Voltage Selector	1		Z
CH10	RUV482Z	Cover,AC IN Jack	1		○Z
CH11	RDG5656Z	Gear,Dial	1		○Z
CH12	RDG5658Z	Gear,Dial Scale	1		○Z
CH13	RJS219Y-X	Socket (7P),PC Board	1		Z
CH14	RJS112Y-X	Socket (6P),PC Board	1		Z
CH15	RJS217Y-X	Socket (5P),PC Board	2		Z
CH16	RJS216Y-X	Socket (4P),PC Board	1		Z
CH17	RJS253Y-X	Socket (3P),PC Board	1		Z
	RJP119Z	Plug (7P),Socket	1		Z
	RJP142Z	Plug (6P),Socket	1		Z
	RJP116Z	Plug (5P),Socket	2		Z
	RJP107Z	Plug (4P),Socket	1		Z
	RJP137Z	Plug (3P),Socket	1		Z
CH18	RDV2Z	Belt,Dial	1		○Y
	XYNR26+C6	Screw,Dial Gear M'tg	2		Z
	XXAR3H6S	Screw,Dial Scale M'tg	2		○Z

Ref. No.	Part No.	Part Name & Description	Per Set		Remarks
	XUC2FY	Circrip,Shaft for Band Switch	1		Z
	XUC6FY	Circrip,Dial Scale Gear M'tg	1		Z
	XNS8	Nut,Bass,Treble and etc.M'tg	6		Z
	XWS8AW	Washer,Bass,Treble and etc.Mtg	6		Z
CH19	RJJ62B	Jack,EXT.SP.,MPX OUT,REC OUT	3		Y
		ACCESSORIES			
	XEH1A1-P	Magnetic Earphone	1		Y
	RJA20Z-K	Power Cord,AC	1		Y
	RKE234Z	Hood,Dial	1		○Y
	RQC9013Z	Belt,Cabinet	1		○Y
		PACKING MATERIALS			
	RPP214Z	Polyethylene Cover	1		Z
	RPN9227Z	Pad Complete	1		○Z
	(Not Available, Order RPN9227Z)	Pad,Left Side	(1)		
		Pad,Right Side	(1)		
	RPN2567Z	Pad,Both Side	2		○Z
	RPK590Z	Gift Box	1		○Z
	RPK590Y	Gift Box,For Italy	1		○Z
	RQX6198Z	Instruction Book	1		○Y

■ CHASSIS PARTS LOCATIONS

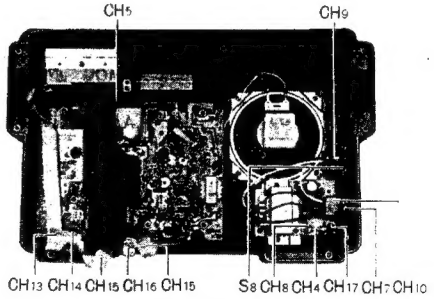


Fig. 30

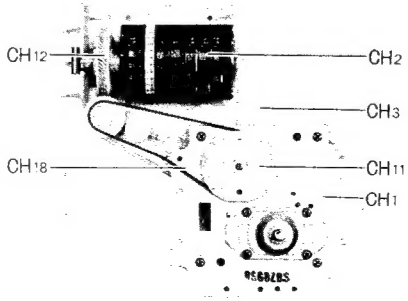


Fig. 31

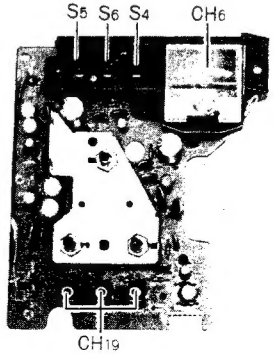


Fig. 32

R D (E) XG/XL
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